

PATENT CLAIMS

1. High-transparency plastic materials, characterized in that they are laser-markable and/or laser-weldable due to a content of nanoscale laser-sensitive metal oxides.
2. The plastic materials according to claim 1 or 2, characterized in that the particle size of the included metal oxides is 1 to 500 nm.
3. The plastic materials according to claim 3, characterized in that the particle size of the included metal oxides is 5 to 100 nm.
4. The plastic materials according to claims 1 through 3, characterized in that the content of metal oxides is 0.0001 to 0.1 weight-percent, preferably 0.001 to 0.01 weight-percent, in relation to the plastic material.
5. The plastic materials according to claims 1 through 4, characterized in that they contain doped indium oxide, doped tin oxide, or doped antimony oxide as the nanoscale laser-sensitive metal oxide.
6. The plastic materials according to claim 5, characterized in that they contain indium-tin oxide or antimony-tin oxide as the nanoscale laser-sensitive metal oxide.
7. The plastic materials according to claim 6, characterized in that they contain blue indium-tin oxide as the nanoscale laser-sensitive metal oxide.

8. The plastic materials according to claims 1 through 7, characterized in that the plastic matrix is based on poly(meth)acrylate, polyamide, polyurethane, polyolefins, styrene polymers and styrene copolymers, polycarbonate, silicones, polyimides, polysulfone, polyethersulfone, polyketones, polyetherketones, polyphenylsulfide, polyester, polyethylenoxide, polyurethane, polyolefins or fluorine-containing polymers.
9. The plastic materials according to claims 1 through 8, characterized in that they are based on polymethyl methacrylate.
10. The plastic materials according to claims 1 through 8, characterized in that they are based on bisphenol-A-polycarbonate.
11. The plastic materials according to claims 1 through 8, characterized in that they are based on polyamide.
12. The plastic materials according to claims 1 through 11, characterized in that they are provided as molded bodies, semifinished products, molding compounds, or lacquers.
13. A use of nanoscale laser-sensitive metal oxides for producing high-transparency laser-markable and/or laser-weldable plastic materials.
14. A method for producing high-transparency laser-markable and/or laser-weldable plastic materials according to claims 1 through 12, characterized in that the nanoscale laser-sensitive metal oxides

are incorporated into the plastic matrix with high shear.

15. The method according to claim 12, characterized in that the nanoscale laser-sensitive metal oxides are incorporated into the plastic matrix in the form of a concentrated pre-mixture with the plastic material.
16. A method for welding plastic molded bodies or plastic semifinished products, at least one of the parts to be joined comprising plastic materials according to claims 1 through 12 at least in the surface area, in that the join face is irradiated with laser light to which the metal oxide contained in the plastic material is sensitive.
17. A use of the plastic materials according to claims 1 through 12 for producing laser-markable production products.
18. A method for identifying production products, produced from plastic materials according to claims 1 through 12, in that these are irradiated with laser light to which the metal oxide contained in the plastic material is sensitive.